

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
30 June 2005 (30.06.2005)

PCT

(10) International Publication Number
WO 2005/059594 A1

(51) International Patent Classification⁷: **G01V 5/00**
(21) International Application Number:
PCT/IL2004/001128
(22) International Filing Date:
14 December 2004 (14.12.2004)
(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data:
159406 16 December 2003 (16.12.2003) IL

(71) Applicant (for all designated States except US): **SOREQ
NUCLEAR RESEARCH CENTER** [IL/IL]; Nahal
Soreq, 81800 Yavne (IL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **GOLDBERG, Mark**
[IL/IL]; Soreq NRC, Route 4111 West, 81800 Yavne (IL).

(74) Agent: **KLEIN, David**; Beit HaRof'im, 18 Menuha VeNa-
hala Street, Room 27, 76209 Rehovot (IL).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

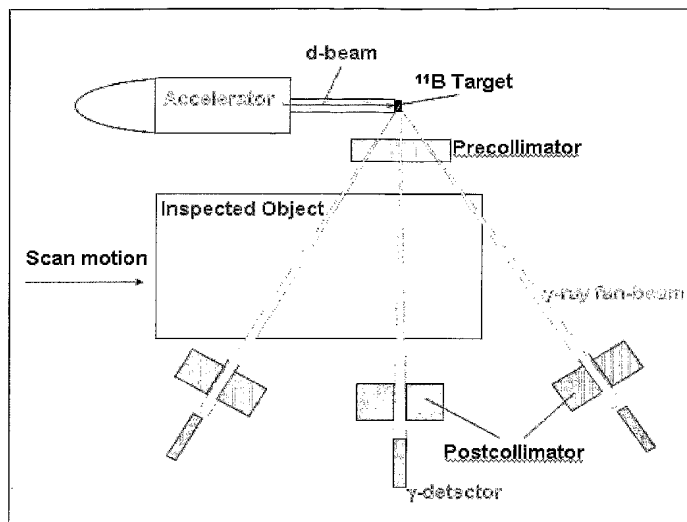
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND SYSTEM FOR DETECTING SUBSTANCES, SUCH AS SPECIAL NUCLEAR MATERIALS



(57) Abstract: A system for detecting substances, the system including a dual-energy radiography (DER) system including a gamma-ray radiation source, including a beam accelerator and a target to which the accelerator sends a beam thereby producing gamma rays, and a plurality of gamma ray detectors positioned to detect gamma rays that pass from the gamma-ray radiation source through an object to be inspected, wherein the DER system is adapted to indicate a presence of a high-Z substance, by detecting a difference in a transmission attenuation characteristic of the high-Z substance as opposed to low-Z and medium-Z substances and differentiating among high-Z substances according to their density, as determined from a plurality of radiographic views.

WO 2005/059594 A1